

Erik A. Roberts

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Education

Boston University School of Medicine

MD-PhD Candidate in Biomedical Engineering, expected graduation May 2021.
Extracurricular electives: Global Health Elective, Spectrum of Physician Advocacy Elective

University of California, San Diego

BSc in Bioengineering, Magna Cum Laude, June 2012.

Research Experience

Boston University, Department of Mathematics & Statistics, Neural Dynamics Group

Advisor: Nancy Kopell, PhD

Graduate Research Assistant, June 2014 – May 2019

Created biophysical computational models of neural oscillations to better understand the dynamical mechanisms of sleep and anesthesia. Utilized statistical learning and signal processing techniques to analyze brain electrical recordings. Developed software for neural simulation and data visualization.

UCSD Department of Bioengineering, Cardiac Mechanics Research Group

Advisor: Andrew McCulloch, PhD

Research Assistant, January 2011 – June 2012

Designed a computational model of heart cell signal transduction to better understand receptor desensitization.

Stanford School of Medicine, Department of Otolaryngology Head & Neck Surgery

Advisor: Nikolas Blevins, MD

Research Intern, Summer 2009 – 2011

Developed a workflow to create patient-specific virtual models that support real-time simulation and haptic interaction in a skull base simulator for surgical planning and training.

UCSF School of Medicine Department of Pediatrics

Advisor: Yao Sun, MD, PhD

Research Intern, Summer 2007

High School Summer Internship Program in Biomedical and Health Sciences. Explored the benefits of a web portal to allow parents of intensive care nursery patients to interact with the medical staff and remotely view treatment progress.

Publications

Roberts, E.A. (2019). *Global neural rhythm control by local neuromodulation* (Doctoral dissertation, Boston University).

Sherfey J.S., Soplata A.E., Ardid S., **Roberts E. A.**, Stanley D.A., Pittman-Polletta B.R. and Kopell N.J. (2018) DynaSim: A MATLAB Toolbox for Neural Modeling and Simulation. *Front. Neuroinform.* 12:10.

Howe, W.M., Gritton, H.J., Lusk, N. A., **Roberts, E.A.**, Hetrick, V.L., Berke, J.D., & Sarter, M. (2017). Acetylcholine release in prefrontal cortex promotes gamma oscillations and theta-gamma coupling during cue detection. *Journal of Neuroscience*, 37(12), 3215-3230.

Kondabolu, K.*, **Roberts, E.A.***, Bucklin, M., McCarthy, M.M., Kopell, N., & Han, X. (2016). Striatal cholinergic interneurons generate beta and gamma oscillations in the corticostriatal circuit and produce motor deficits. *Proceedings of the National Academy of Sciences*, 201605658.

Roberts, E.A., Troiano, C., & Spiegel, J.H. (2016). Standardization of Guidelines for Patient Photograph Deidentification. *Annals of plastic surgery*, 76(6), 611-614.

Kondabolu, K., Kowalski, M.M., **Roberts, E.A.**, & Han, X. (2015). Optogenetics and deep brain stimulation neurotechnologies. In *Cognitive Enhancement* (pp. 441-450). Springer International Publishing.

* indicates co-first authorship

Poster Abstracts

Roberts E.A., Kopell N.J. (2017) GIMBL-Vis: A GUI-Based Interactive Multidimensional Visualization Toolbox for Matlab. BMC Neuroscience 2017, 18(Suppl 1):P136.

Roberts E. A., Kondabolu K., Abdulkerim M., McCarthy M. M., Kopell N., Han X. (2015). Enhanced corticostriatal beta oscillations and synchrony mediated by optogenetic increase of striatal cholinergic tone. 2015 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience.

Roberts E.A., Salisbury K., Chan S., Blevins N.H. (2011). Tissue Modeling in a Patient-Specific Skull Base Surgical Simulator. *Otolaryngology — Head and Neck Surgery*.

Teaching Experience

BU BE402 – Control Systems in Biomedical Engineering

Teaching Fellow, Spring 2016 & 2017

Taught weekly discussion sections and led review sessions for the class.

Entrepreneurship

Harvard GSAS Business Club Mini-MBA, Summer 2018

BU Startup Bootcamp, Spring 2018

Leadership Experience

Geek Speak Toastmasters at BU

Co-Founder, June 2015

VP Education, June 2015 – June 2016

Started the first toastmasters club on the BU Charles River campus. Sought to improve public speaking and leadership skills among club members through various presentations on public speaking.

Psychiatry Society at BU

Co-Leader, November 2013 – June 2014

Organized events to foster student interest in psychiatry.

Physicians for Human Rights at BU

Co-Founder, October 2013 – February 2014

Implemented a 6-part human trafficking education series.

Christian Medical & Dental Associations at BU

Programming Coordinator, February 2013 – February 2014

Implemented school-wide events focusing on spiritual education issues. Organized a 5-part training on housing insecurity.

UCSD Student Health Advocates

Student Health Advocate, March 2010 – June 2012

Taught health information to peers at residence hall outreaches. Conducted weekly presentations to promote general health education. Obtained patient vital signs at the student clinic.

Co-President, September 2011 – June 2012

Planned and led weekly officer meetings. Oversaw budgeting and planning of all events. Supported other officers in their duties. Created innovative new programs.

Work Experience

Boston University School of Medicine

Disease and Therapy Tutor, September 2014 – January 2017

Neuroscience Tutor, December 2013 – January 2014

The Guardian Newspaper, UCSD

Staff Photographer, October 2010 – June 2012

Carried out photographic assignments including documentation of student events, recreational activities, and other areas of editorial interest.

AllMac

Computer Technician, September 2007 – January 2008

Provided direct customer support. Diagnosed and repaired Apple devices.

Volunteering

Hyde Square Task Force

Mentor, 2014-2015

Supported a high school student during the college application process, helping him to become the first in his family to attend college.

Awards/Honors

MIT Hacking Medicine 2017 Best Epilepsy Hack

Pitched a mobile app called *Centered* for providing resources and a supportive community to adults newly diagnosed with epilepsy.

Phi Beta Kappa, 2012

Provost Honors, 2009 – 2012

Making of the Modern World Writing Showcase, May 2010— for best paper in a history course